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(54) IMPROVEMENTS IN OR RELATING TO SCRAPER-CHAIN CONVEYORS

- (71) We, GEWERKSCHAFT EISENHUTTE WESTFALIA, a body corporate organised and existing under the laws of Western Germany, of 4628 Wethmar bei Lunen, Westfalia, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- 10 The present invention relates generally to scraper chain conveyors and particularly to a side member or wall for use in scraper chain conveyors.
- 15 In coal mining, conveyors are known in which generally U-shaped guide channels for the chains and/or scrapers are defined by the inside of the side members of the conveyor. These conveyors are most suitable for the transport of coal or materials with similar sliding and lubricating properties.
- 20 These conveyors normally use scraper-chain assemblies of the type in which chains are disposed at the ends of the scrapers and are offset from the centre of the conveyor floor to be guided in the guide channels defined by the side members.
- 25 In order to increase the life of such conveyors it is known for wear-resistant guide pieces to be attached to the inside of the side members. The main purpose of these known guide pieces is to enable the circulatory paths of the chains running in the guide channel to be controlled so that the continual motion of the chain will not cut grooves into the side member or into the conveyor floor.
- 30 For other types of minerals a different form of conveyor is more suitable. In this form of conveyor the side members may define generally V-shaped guide channels for guiding scrapers of a scraper-chain assembly which has one or more chains disposed at the longitudinal central zone of the conveyor floor.
- 35 Hitherto the side members for one type of conveyor have not been suitable for use with the other type of conveyor and a general object of this invention is to mitigate this problem and provide a side member for a scraper chain conveyor which is suitable for use with a wide range of materials.
- 40 According to the present invention there is provided a side member or wall for use in scraper chain conveyors; said side member being generally sigma-shaped with upper, lower and central flanges, guide channels defined by internal surfaces of the member and adapted to guide a scraper-chain assembly and further guide channels, which are of generally V-shaped profile, adapted to guide a further scraper-chain assembly, said further guide channels being defined at least partly by wear-resistant inserts attached to some of the internal surfaces of the member.
- 45 Further according to the invention there is provided a scraper chain conveyor having generally sigma-shaped side members each with upper, lower and central flanges, normal guide channels defined by internal surfaces of the side members and further guide channels of generally V-shaped profile defined at least partly by wear-resistant inserts attached to some of said internal surfaces, the further guide channels being adapted to guide a scraper-chain assembly of the type having a chain or chains disposed at the longitudinal centre of the conveyor and the normal guide channels being adapted to guide a scraper chain assembly of the type having chains disposed laterally offset from the longitudinal centre of the conveyor.
- 50 In another aspect the invention provides a side member which is generally sigma-shaped with an upper flange, a lower flange and a central flange, and which has guide channels defined by internal surfaces of the member, the guide channels being adapted to guide a chain of a scraper-chain assembly of the type having chains disposed laterally offset from the longitudinal centre of the conveyor or an element associated therewith, there being further provided wear-resistant inserts attachable to some of the internal surfaces of the side members to form further guide channels of generally V-shaped profile, said further guide channels being disposed inwardly towards the centre
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of the conveyor relative to the first-mentioned channels, the further guide channels being adapted to guide a scraper element of a scraper-chain assembly of the type having a chain or chains disposed at the longitudinal central zone of the conveyor. The guide channels may be generally U-shaped.

The inserts are preferably attached to the member by means of screws or rivets although welding is possible. In any event the side member can be used with both types of scraper-chain assembly mentioned hereinbefore by attaching or detaching the inserts.

Each insert is preferably made from hard manganese steel.

A conveyor constructed in accordance with the invention is suitable for use under the most widely varying conditions. The basic side member defining the normal guide channels is of the type widely used for coal transport in many countries where the scraper-chain assembly is of the double-chain type with chains guided in the channels i.e. laterally offset from the centre of the conveyor. Where the use of a central chain type scraper-chain assembly is more desirable, as in ore transport, the wear-resisting inserts can be readily attached to the side member to provide the modified guide channels. The construction of the inserts can be adapted, in accordance with the various conditions of use, to the most suitable shape for the ends of the scrapers to be guided thereby.

Owing to the optional use of the outermost normal guide channel or of the innermost further guide channel, the wear-resisting properties and thus the length of life of a conveyor constructed in accordance with the invention can be considerably increased.

Although the adaptability of the side member and conveyor provided by the interchangeability of the inserts is significant the invention also enables a scraper-chain conveyor using a scraper-chain assembly of the type having chains offset from the centre of the conveyor and guided in the normal guide channels to be adapted by means of the inserts, after a certain period of use for permanent future use with a scraper chain assembly of the type employing a chain or chains at the centre of the conveyor where the scraper elements are guided in the newly defined guide channels.

The invention may be understood more readily and various other features of the invention may become more apparent from consideration of the following description.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 is a cross section through a part of a scraper chain conveyor employing a

side member made in accordance with this invention, and

Figures 2 to 4 are similar cross-sections depicting other types of side members made in accordance with the invention.

As shown in Figure 1, a scraper chain conveyor 2 is provided with sigma-shaped side members 1, which are made in accordance with the invention. The conveyor 2 has a central floor 4 in respect of which each side member 1 defines an upper guide channel 5 and a lower guide channel 5 in which can be circulated the working run and the return run of the conveyor respectively.

Each guide channel 5 is generally U-shaped and serves to guide the chains 6 of a double-chain scraper assembly or elements 7 associated with the chains 6. The chains 6 are moved to displace material along the floor 4 with the aid of scrapers and the chains 6 and/or elements 7 move alongside guide surfaces 8, 9 and 10, and 8¹, 9¹ and 10¹ respectively.

As depicted in Figure 1 the normal outermost guide channels 5 defined by the member 1 itself are modified by the presence of wear-resistant inserts 3 and 3¹ which form innermost further guide channels 5¹ which are generally V-shaped. In this example the inserts 3, 3¹ take the form of flat bars which bridge the guide surfaces 8, 9, and 9¹, 10¹. The inserts 3, 3¹ are depicted as being welded to the member 1. The V-shaped guide channels 5¹ serve to guide scrapers 12 connected up to one or more chains 11 disposed at the central zone of the conveyor floor 4 in contrast to the chains 6 which are offset from this central zone.

Thus, the conveyor can use the form of scraper-chain assembly with scrapers 12 shown in continuous lines in Figure 1, and a central chain or chains 11 in which case the inserts 3, 3¹ are utilized. Alternatively, the conveyor can use the form of scraper assembly shown in broken lines in Figure 1, with chains 6 disposed laterally outwardly from the longitudinal centre of the floor 4, in which case the inserts 3, 3¹ are dispensed with. The latter assembly is more suitable for transporting coal whereas the former assembly is more suitable for mineral ores.

Figures 2 to 4 show alternative constructions for the inserts 3, 3¹ and like reference numerals are used to denote like parts. In Figure 2, each inner guide channel 5¹ is formed by the provision of a single insert 13 which is secured to the upper flange and lower flange of the side member 1 to engage the surfaces 8, 9 and 8¹, 9¹ by means of screws 17.

In Figure 3 each channel 5¹ is formed by utilizing two inserts 14, 15 again attached to the member 1 by means of screws 17.

In Figure 4, in a particularly advantageous version of the invention, each guide channel

FIG. 1.

